

## THE INTENSIVE RADIOTHERAPY OF CANCER NOT A NEW METHOD.

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It has been said lately that the system of massive doses in radiotherapy—doses pushed to the extent of radiodermatitis—was a new method, essentially German.

In order to convince oneself of the contrary, it will suffice to cast a rapid glance over the following observation, dating back twenty years, which was the subject, in 1903, of two consecutive communications to the Academy of Medicine, that of A. Darier\* and mine.†

Here is the exact text of the observation furnished by A. Darier in the Clinique Ophthalmologique of October 10th, 1903:—

“A striking example‡ will show that the action of x-rays is indeed real, and very powerful; almost miraculous.

“It was the mother of one of my friends, aged 64, suffering for the past three or four years from tumors, which spread rapidly from the arms to the face, to the eyes, and especially on the neck.

“Little by little the tumors invaded the thorax, descending to the mediastinum in a thick

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\*A. Darier. Académie de Médecine, October, 1903 (referring to Rivière's method).

†J. Rivière. Physiotherapy applied to the Cure of Cancer (in French) Académie de Médecine, December 8th, 1903.

‡This refers to Dr. A. J. Rivière's method.

mass, as far as the level of the heart. The trachea and large bronchi were compressed, so much so that a very marked wheezing made itself heard, and breathing became so painful that at every moment we feared to see death supervene from suffocation. All medical treatment had been tried, including arsenic and quinine in large doses. This latter had, for a moment, brought transient improvement. The tumors had invaded the eyes; this is what brought the patient to us. In so serious a state it was permissible to try everything, and the x-rays could have no more harmful effect than the much-dreaded affection. §

“The histological examination, made by Jean Darier, at the College de France, showed that it was a question of tumor, and not infectious neoplasm, syphilitic, tuberculous, etc.; that this tumor was not a sarcoma with little round cellules, but certainly an alveolar sarcoma of Billroth, that is to say, a lymphosarcoma. This lymphosarcoma is one of the variety equivalent to a fine adenoid, having small lymphoid cellules all alike; it is, then, a lymphadenoma.

“The prognosis was not in doubt, and death appeared to be near. As I was on the point of going away from home, and thus unable to perform the radiotherapeutic treatment myself, I sent the patient to my eminent confrère and friend, Dr. Rivière, begging him be so kind as to replace me in this treatment, one which

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§At that time the action of x-rays in malignant tumors was denied by the Faculty, except Prof. Doumer of Lille (France) who communicated a case of stomach cancer cured, but the Medical Corps objected that there was no histological examination made.

he would certainly apply better than I could have done myself.\*

“When I came back after eighteen days, the condition of the patient had improved to such an extent that all the tumors of the face had disappeared. The eyes, which had been unable to open, especially on the left (a tumor as large as a nut was on the upper eyelid) had absolutely regained their normal aspect; the neck tumors had considerably diminished and the oppression no longer existed. The patient had had fifteen applications of radiotherapy.

“At this moment Dr. Rivière had to suspend his treatment, as a fairly well marked radio-dermatitis was produced on the face, the neck, thorax and arms; but the patient, in spite of the itching produced by the dermatitis, asked only to continue the treatment.

“By radioscopy one could see that the neoplastic mass no longer came down, as before, as far as the heart, but was visible only above the sternum.

“To sum up, it is sufficient to know that in less than three weeks all the tumors of the eyes and eyelids had completely disappeared, and that those on the neck had considerably diminished; the breathing had become free enough to allow the patient to believe herself cured.

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\*Dr. Darier, who was not a specialist in Roentgenotherapy, knew at that time, as every medical man, that immediately after the discovery of x-rays, I was using these powerful physical agents against cancer and tuberculosis. I was in the habit of writing to medical colleagues for the purpose of asking them to send me patients whom I treated gratuitously.

Today, October 6th, there is no tumor remaining.†”

Below, moreover, adds Dr. Darier, is the note supplied by Dr. Rivière concerning the patient whose treatment he had handled so well.‡

“The physiotherapeutic treatment which I have applied to Mme. X., and began July 15, 1903, consisted in a daily application of Roentgen rays for ten minutes, followed immediately by a local application of ample bi-polar effluvia of high frequency. The rays employed were half soft,§ produced by a large bi-anodic Muret tube, influenced by a spark coil of 40 centimetres,\* whose condensing capacity was 0 microfarad 66. The interruptions to the number of 1,200 a minute were supplied by a mercury interruptor, worked by a motor. The primary current of the coil measured 60 volts, with an intensity of 6 amperes at the moment of interruption. The quality of the rays corresponded to No. 7 of Benoist’s radiochromometre. The anticathode was placed at a distance of 20-25 centimetres from the integument.

“At the 15th sitting I had to stop all radiotherapeutic application; the patient, taking advant-

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†A cure which is maintained. On December 12th the patient’s son-in-law wrote to Dr. Rivière, “To-day my mother-in-law is 66; it is now 18 months since you cured her; she feels no more indisposition and no relapse has been observed.” Letter published in the *Annals of Physiotherapy*, January, 1905.

‡Communication to the Academy of Medicine, 1903, and *Clinique Ophthalmologique* of Paris, October, 1903.

§In reality it was a question of penetrating rays applied in massive doses.

\*Which means sufficiently penetrating rays—those which give the best results now.



age of a less strict surveillance, had approached too near the tube. Hence resulted a radiodermatitis which extended all over the face, arms and antero-superior part of the trunk.†

“Dating from this moment, for about 60 days the patient received daily on the affected parts a quarter of an hour of static application obtained by means of a vegetable brush.

“The radiodermatitis which, moreover, did not proceed to ulcerate, has been, in my opinion, of a most beneficial kind. It appeared to hasten considerably the disappearance of the lymphosarcomatous masses.

“The long experience which I have already acquired in the application of x-rays for treatment of cancers, has led me to think that it was necessary, in order to obtain genuine curative effects, to employ in massive doses x-rays of different qualities, according to the nature and depth of the anatomical tissues to be traversed.

“These applications necessitate, in the operator, a complete mastery of his materials and his radiogenic focus, so as to stop this intensive treatment in time and thus avoid ulcerating dermatitis.

“In the case before us, one can see that a simple dermatitis, quite superficial, has clearly favored the retrogression of the neoplastic masses. But it was evidently a question of a specific dermatitis, which no other irritating agent, chemical or physical, could imitate in its essence.”

The result of these observations is that, since 1903, I had drawn attention to the fact that

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†This large superficial radiodermatitis is proof of the intensity of the treatment.

“massive doses of x-rays, sufficiently penetrating, applied for 15 successive days from a spark coil of 40 centimetres had radically cured a patient attacked with malignant generalized tumor, with deep manifestations and cachexia in extremis.

I again saw the necessity of employing massive doses of x-rays, about which I have made frequent contributions to different Medical Congresses; especially one in “Physiotherapy of Cancer,” 23rd Annual Meeting of the American Electrotherapeutic Association, New York, September 19th, 1913, in which I added that it was necessary to provoke purposely radio-dermatitis. This has doubtless stimulated the new experiments of intensive radiotherapy in Germany.

My method remains the one which gives the best results, and the actual use of more powerful apparatus constitutes not a new method, but a modality, a mere procedure of application. There is nothing new, either in the artifice, now long since employed, of reaching the tumor at different angles.

The two methods of scintillations and intensive radiations before and during operation, as well as after the operation, constitute what I have called the cytolysis of cancer.† Our contradictor never gives dates; and looks on me as a competitor still living.

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†J. Rivièrè. Analytical reflections on cancer and its physiotherapeutic treatment. *Annals of Physiotherapy*, December, 1903. Our opinion on the microbe of cancer, *ibidem*, January, 1903; A case proving the cure of profound sarcoma by physiotherapy, *ibidem*, January, 1905. Effluvia and sparks of high frequency in the treatment of malignant tumors. French Medical Congress, October, 1907;

I have since 1900 and 1903 fully exposed the specific and elective action of alto-frequent scintillations—sparks and effluvia and of x-rays on the newly-formed cell.\* I was the first to state that this cell, insufficiently attached to the system by atavistic nerve-direction is definitely rendered dead, at a time when the vitality of the healthy tissues finds itself increased, to the great advantage of their processes of defence and reparation. This opinion has been confirmed much later by laboratory experiments.

I have at these two periods successfully drawn attention to the retrogression of the ganglia, the resolution of oedemas, the cleansing lymphorrhoea. I have shown foetid ichor to be replaced by a serosity of better alloy, the scars taking on perfect suppleness and an anesthetic character. I have insisted, in fine, on the necessity of using rays of different quality and quantity according to the tissues and depth of the mischief.

The effects of physical cytotherapy tend to the agglomeration of the secondary microor-

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Alto-frequent cytolysis and fulguration of cancer, Académie des Sciences, March 22nd, 1909. Treatment of malignant tumours by effluvia and sparks of high frequency, 16th International Medical Congress, Budapest, August-September, 1909. High frequency and neoplasms (5th International Congress of Medical Electrolgy and Radiology, Barcelona, September, 1910); Physicothérapie of Cancer (23rd Annual Assembly of the American Electrotherapeutic Association), New York, September, 1913.

I often have an x-ray sitting preceded by high frequency applications, in order to raise local temperature. Occasionally, also, I inject medicinal products, colloidal and otherwise, in the neoplastic mass, before submitting it to scintillations and rays.

\*Ist International Congress of Medical Electrolgy and Radiology, Paris, July-August, 1900.

ganisms, to the sterilization of their cultures, to the destruction of their toxins. But the principal action is certainly in the disintegration of the neoplastic cells. It is the potential antidote above all others to proliferate karyokinesis of the elements, called by me anarchic. The cytolysis, then, exercises a very clear retarding action in the new cancerous formations, which might produce metastatic embolism. Cytolysis is more than a disintegration of the cells, it is their destruction. It is also the forerunner of rehabilitation for the healthy cells subjected to nerve-control. For my part, I am convinced that superficial radiodermatitis must be admitted, and even sought for, in the treatment; even more, ulcerative radiodermatitis, methodically pursued, would be a powerful aid to necrobitic and toxic elimination, of which I was the first to bring out the fundamental necessity.

The cytolysis of cancer embraces high-frequency scintillations, x-radiations and those of radium. At the same time it constitutes the principle and the method itself.\*

\*In the same way, the terms "fulguration" and "electrocoagulation" of Pozzi and Doven have in no way changed the method of alto-frequent cytolysis indicated in my communication of 1900. These two methods of applying High Frequency current combined with surgical operation, are precisely the same as I had indicated in my different observations and in my former conclusions of 1900. My priority rights in the matter have been affirmed, moreover, by numerous French and foreign greatest authorities. Suffice it to cite, among others; d'Arsonval, G. Weiss, Pierre Delbet, Gariel, Oudin, Larat, Guilleminot, Foveau de Courmelles, Labbé, Doyen, Bouchon, Joseph Thomas, Charles Schmitt, Bainbridge, Benham-Snow, Humphris, Hertoghe, etc.

Professor Doumer (of Lille), speaking of my



In my communication of 1900, I had spoken of the actineoplastic action of the actinic rays, and we were able to observe, in the case of the patient whose case I have cited above, the result of the combined action of these rays with the x-rays. It therefore appeared certain to me, as I said to Dr. A. Darier in 1903, that radium, which contains the two modalities of x-rays, ought to act with equal efficacy in cancer. I was destined at that moment to get possession of the first piece of radium delivered to the public. A. Darier accompanied me to the only place where the new metal was on sale for the first time, and we then began the first experiments with cancer. I then forwarded Morton the same address, and thus it was that he was the first to apply the precious metal to cancer in America.

In order to confound one who looks upon me as a living competitor, and continues to employ methods to deprive me of my rights to priority, never giving dates, I think it necessary to add the following to the article above perforce much shortened, and which appeared in the Journal *The Neoplasm* under my signature.

I reproduce first of all the conclusions reached in my communication of 1903 to the Academy of Medicine, where, for the first

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book: *Clinical Sketches in Physiotherapy*, writes: —“In the group of neoplasms, a first chapter is given up to uterine fibromata; a second, very important, to cancer and its physiotherapeutic treatment. Very long developments are naturally devoted to Roentgen rays, and to the mode of destruction of the neoplasia by high frequency, a method whose discovery belongs to Rivière.” (*Annals of Electrology and Radiology*, August, 1910.)

time, the diagnosis of treated tumors was supported by histological examination:—

“1. Our practice in physiotherapy for the cure of neoplasms must be regarded by modern medicine as a very useful method for obtaining diminution of tumors, calming of the painful element, and disappearance of the ganglion swellings.

“2. Physiotherapy is the sole method to employ against certain neoplasms which are inoperable or destined to rapid reproduction; in the vegetating forms, either ulcerating or piercing, of the epithelioma; in sarcomas and carcinomas which are constantly recurrent and active as a consequence of surgical intervention.

“3. We employ, for preference, radiotherapy, d'Arsonvalisation, without neglecting the general physiotherapeutic media, such as calomel, water and quinine internally, in order to urge on the elimination and neutralisation of neoplastic elements, mobilized into force by local treatment causing them to return to the circulatory stream.

“4. The most salient effects of physiotherapeutic treatment are: disappearance of the oedemas, swellings and indurations, cessation of lightning pains and others, rapid and complete cicatrisation of the *ulcus rodens*, effacement of the vegetating excrescences; finally the complete disappearance of cachexia and thinness, and return to a healthy state of the general condition.

“5. Although cures are frequent in cases of operative recurrences, it is preferable to treat the neoplasms in this way at the outset. Radi-

otherapy will always have to extend beyond the lesion, as histology proves to us that the neoplasm always spreads further than the apparent lesion.

"6. In spite of notable and rapid improvements—relief of pain, retrogression of foci, arrest of adenopathic proliferation, one must use an indispensable perseverance in the treatment of the physical agents, especially as to the continuation of general methods destined to improve the diathesis.

"7. Finally, I believe we can affirm, relying on my personal observations and numerous analogous observations due to my confrères, to this High Court that treatment of malignant diseases has entered on a new phase, thanks to applications of modern physiotherapeutic methods. The facility, simplicity, ease and promptitude of our treatments, the aesthetic regularity of the results obtained, the return to integrity of the compromised functions—all these give to physiotherapy an incontestable curative value; as much from the point of view of the numerous cures, as the lasting nature of the improvements, in cases, primitive or recurrent, which seemed quite beyond the resources of medical art."\*

The following is an extract from the report of Dr. Joseph Thomas:—

On the therapeutics of cancerous affections by physical agents, Algiers, April 4th to 10th,

7. 8th International Congress of climatological Hydrology, Geology and Therapy by physical agents.

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\*Bulletin of the Academy of Medicine, 3rd series, T. L., pp. 186 and 501.

“Fulguration. — The first applications of high frequency sparks to the treatment of cancerous affections dates from the First International Congress of Medical Electrology and Radiology held at Paris, July, 1900, and due to Dr. Rivière.†

“Dr. Keating-Hart, at the Milan Congress, September, 1906, returned to the question. However, it would be unjust not to recognize that the work of Rivière, in accordance with the dates just cited, is anterior by six years to that of Dr. Keating-Hart, and moreover, that the name of ‘fulguration’ given to this latter method by Dr. Pozzi, does not constitute, in the proper sense of the term, a new method of treatment, and might thus create an awkward mistake.

“In 1900 Rivière terminated his report, as follows:—

“The result is, he says, that high frequency currents seem to cure epitheliomata of the face, and to exercise in certain cases a happy influence on the evolution of certain malignant tumours.

“They produce first of all a thermo-electro-chemical action whose effect is to eliminate the

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†When Keating-Hart spoke of the method of treating malignant tumors, with high frequency sparks, Professor Doumer, who was presiding at the Congress, said that it was Rivière’s method which had been brought forward at the 1900 Congress, when he was General Secretary. Keating-Hart agreed that it was indeed Rivière’s method. When Pozzi gave the name of “fulguration” to the method in October, 1907, at the Congrès de Chirurgie, Paris, Doven did as Doumer had done in Milan, and pointed out that the method was Rivière’s.



neoplastic tissues; and, if one admits the parasite theory, to destroy the micro-organisms and their toxins, and in the second place, a curative tropho-neurotic action, which brings back the vital processes to the normal.

“There can be no question about employing the thermo-electro-chemical action so as to eliminate large tumors, the removal of which by knife remains an elective process; but to this mechanical treatment should be added and succeed the preventive treatment and one which prevents relapse. High frequency currents and especially the monopolar effluvia‡ of the Oudin resonator, seem to exercise this action, by modifying the vitality of the new regions contaminated by the operative breach, after having disinfected and drained them. This special mode of application of electricity appears to be at present one of the only therapeutic means which can be tried in cases of inoperable tumours.”

Thus then, concludes Dr. Thomas, who is a doctor of medicine, and a doctor of science, and an authority on cancer. Ever since 1900, Rivière had advised that every operation for malignant tumor should be “immediately followed by applications of sparks and high frequency effluvia, to avoid contamination in the operatory breach and to prevent recurrence. He had demonstrated the cytolytic action of

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‡In the text of the work, the word “sparks” was used. At the very commencement, there was a confusion between sparks and effluvia; both were employed by me for the first time, as I also had the first apparatus known, an exact replica of those of d’Arsonval.

the spark on the neoplastic cell, and remarked that the healthy tissues were not affected.

“In 1903, in a communication to the Academy of Medicine, as well as in other publications, Rivière has indicated that he allied the action of the x-rays to that of high frequency effluvia.”\*

We said moreover, in our communication to the French Congress of Medicine (Paris, October 14th to 16th, 1907), “High frequency effluvia and sparks in the treatment of malignant tumours,” that we had been the first to affirm in 1900 and 1903:

1. That high frequency effluvia and sparks cure malignant tumours, both superficial and deep;†

2. That they destroy the neoplastic masses and leave alone healthy tissues;

3. That their action on lymphoid tumours is most marked;

4. That they should, along with x-rays, when applied after operations, serve to prevent recurrence of malignant tumors;

5. That physiotherapy is the only resource in cases of inoperable tumours;

6. That doses of Roentgen rays must be massive without damaging the teguments;

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\*Minutes of the 8th International Congress of Hydrology, Climatology and Therapy by physical agents. Algiers, 1919, p. 921.

†Juge, of Marseilles, was the first surgeon who popularized my method of alto-frequent scintillations in “the operatory breach,” in order to complete the surgical treatment, to disinfect and drain the sore. My method was called afterwards “fulguration” by Pozzi. (Surgical Congress, Paris, October, 1907.)

7. That radiodermatitis seems sometimes to promote and favor cure;

8. That it is indispensable to drive the necrosed parts to elimination, on account of their return to the general circulation.

9. That the neoplastic cell did not derive benefit from the synergic forces of healthy tissues controlled by the nervous system.‡

10. That it is always necessary to give attention to the general conditions of the organism as well as the local condition.

11. That in the presence of an evil so tenacious and so disturbing as cancer, we must know how to proportion effort to resistance, and bring judiciously into play all the resources of the psychotherapeutic arsenal.

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‡I was the first to call them anarchist cells.

